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NINETIETH CONGRESS

Congress of the United States

House of Representatives

GOVERNMENT ACTIVITIES SUBCOMMITTEE
OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
RAYBURN HOUSE OFFICE BUILDING, ROOM B350-B
WASHINGTON, D.C. 20515

December 5, 1967

The Honorable Charles L. Schultze
Director, Bureau of the Budget
Washington, D. C. 20503

Dear Charlie:

The Subcommittee is proceeding with the evaluation of the hearings on Government management of data processing held in July. Because of the complexity of the matters under consideration, a further period will be required to prepare the Subcommittee's report. Meanwhile, certain facets of data processing usage merit immediate attention, not only by appropriate officials of the Government, other large users, but by the data processing manufacturing industry as well:

1. <u>There is a need for specific problem definition in the data processing standardization effort.</u>

During our hearings, practically every witness agreed to the vital importance of "compatibility and standardization." Over the years, this term has achieved almost universal usage to describe a hazy, uncharted problem area in computer usage stemming from differences in data system design and manufacture. Within the perimeter of this almost meaningless term lie countless problems of differing character and importance to which the term "standardization" has varying meaning and application.

We have followed, up to this point, a "grab bag" approach in attempting to deal with these problems. While we have identified certain areas of difficulty that compromise computer usage, the order and magnitude of our effort has not been controlled by a disciplined order of priority. Nor are we exacting in the definition of the terms we use or of the ultimate goal we seek to achieve. We have assumed without sufficient basis that "standardization" -- whatever this term may mean -- is an overall solution to this entire problem area, although this approach might be either difficult, impossible, or outweighed by some more acceptable, more practical solution.

It follows then that our efforts to increase data processing effectiveness and efficiency require:

(a) Appraisal of the entire computer environment to identify as best we can those aspects of computer systems where variances in design or usage compromise utilization;

(b) defining as specifically as possible the ultimate objective sought to remedy these specific problems;

(c) defining the term "standardization" as this concept may apply to these varying problems;

(d) inclusion within the standardization concept of some practical means of evaluating the need for and the economic value of software and hardware developments that would alter previously adopted standards or affect data processing compatibility;

(e) determining whether "standardization" is essential, simply desirable, or undesirable as a means of solution, and considering possible alternative courses of action as a more practical means to achieve the objective sought.

2. The standardization effort must be altered to optimize results.

The data processing standardization effort operates within the traditional concept followed by American industry for decades. In most instances, in other areas the standardization effort consists merely of recognition of what has already, through usage, become a de facto standard.

In data processing, the principal thrust should be to determine and develop standards in anticipation of usage. In most instances, in data processing, the potential for benefit has passed by the time a de facto standard exists.

Considering the structure of the standardization effort, as well as the intricate network of organizations with varying interests which are often in conflict, it is understandable why there are problems in achieving results sufficiently early in any particular phase of the "state of the art" so that users, as well as manufacturers, can receive some benefit from them.

Whatever the cause, the standardization effort is "cresting" too late to meet demand. The delays are unacceptable no matter how understandable their causes may be.

A critical reevaluation of the entire standardization effort must be made to invigorate and speed up the process so that the effort can be as effective as possible in the solution of those problems that can be properly and practically dealt with through standardization.

3. Independent criteria identifying the characteristics of a new generation common computer language must be developed.

IBM has announced PL/1 will receive primary support in future company software development -- COBOL and FORTRAN only to the extent necessary to maintain industry-accepted standards. There is considerable sentiment among those well-versed in COBOL and FORTRAN and not in the employ of IBM that

there is little value in PL/1. IBM claims the need for a machine-independent language that will also lessen the demand for programmers. To those uninitiated into the complexities of COBOL data handling, PL/1 has a definite charm in its relative simplicity despite the fact that, at least at present, there may be no advantage in compiling and operating time -- the basic measures of language efficiency.

Because of IBM's dominant position and the fact that new users most likely will accept the apparent advantages of PL/1 (compatibility and standardization problems normally are not as apparent in the initial stages of data processing usage), it is reasonably predictable that in the absence of any forceful, affirmative effort, PL/1 could, by default, become the de facto language of the next generation even though it may be less than the best.

USASI has undertaken a pre-standardization effort regarding PL/1. But, such efforts are premature for there is no general independent criteria reflecting user requirements and computer capabilities within the "state of the art" to use as a measure in evaluating the acceptability of this as a new generation language.

Comparisons with COBOL and FORTRAN are not sufficient. Although advantages may be shown, these may not be of a nature or degree sufficient to qualify PL/1 as the next generation language. Furthermore, to the extent that any language can be machine-independent, this quality in PL/1 remains to be proved. Other preliminary questions must be answered; for example, the existence of effective alternatives to standardization, whether the next common language (assuming the applicability of the standardization concept) should and can be of a higher order of standard COBOL and FORTRAN, or whether optimum user benefit requires adoption of a fundamental new approach to language development.

Assuming the validity of applying the standardization concept to computer languages and following development of general criteria necessary or desirable in a new generation language, then a truly effective and meaningful evaluation could be made of PL/1 as well as any other proposed languages or combinations thereof. Under these circumstances, it would then be reasonable to expect IBM, under improved USASI procedures, to adopt changes in PL/1 (including the name of the language) deemed necessary to meet the general criteria. Also, other manufacturers, as well as principal user groups, could be expected to either participate in this standardization effort or accept whatever conclusions that may be reached.

It is unlikely that development of language criteria can take place within the structure of USASI, the National Bureau of Standards, or any of the manufacturer or user oriented organizations. For optimum results, a more detached approach would probably be best. Second, the effort should attract the best minds in the entire data processing community. All of the key people that are needed are not included in the membership of these organizations. For this reason, the Executive Branch should determine the feasibility of establishing a quasi-formal working group or, in the alternative, solicit the interest of some organization to participate in the identification of new generation language criteria.

4. The Bureau of the Budget must push completion of the Federal Government's software inventory.

It has been assumed for years that standardization would bestow countless benefits upon the Federal Government, particularly in the software area. Superficially, at least, the possibility of broad interchange of programs and data offers considerable promise. Undoubtedly, there would be advantages. But, their nature and scope have not been authoritatively determined. A comprehensive inventory of Government-owned software is essential in making any meaningful evaluation in this area.

In addition, an inventory of Government software is needed as a data base for Federal Government policies relating to the procurement of next generation languages. Economically, it may well be that despite the availability of a more effective, modern language, numerous applications in the Government would for years be best served through maintenance of older generation languages. But to make the necessary cost analyses, we must know what software we now have. Therefore, development of the Government's software inventory as part of our data processing information system should be given the highest priority.

In varying degrees, work is under way on many aspects of these problems. In some areas, however, little if anything is being done. Our purpose is to emphasize and invigorate these efforts in a more orderly manner. Literally billions in capital investment and in operational efficiency are at stake. And, we must do the very best we can to provide for optimum data processing usage, not only in the Federal Government, but throughout the national economy. In July, 1966, the President stated the problem in these words:

> "Computers will enable us to achieve progress and benefits which a decade ago were beyond our grasp. The technology is available. Its potential for good has been amply demonstrated, but it remains to be tapped in fuller measure."

This effort towards optimum utilization of data processing has the strong unyielding support of the President and the mandate of Congress. We believe it merits the support of the entire data processing community.

Sincerely,

Jack Brooks
Chairman

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Remarks:

Ernest Baynard, House Government Activities Subcommittee, thought we might be interested in the attached letter from Representative Brooks to BOB concerning data processing. The letter is being forwarded to you for your information and such disposition as you desire.

[redacted]

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FROM: NAME, ADDRESS AND PHONE NO.	DATE
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